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March 1978

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U.S. NAVY MEDICINE

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COVER: At NRMOC Oakland, Navy otolaryngologist CAPT C. Gordon Strom (MC) prepares to use an examining microscope. Dr. Strom and his colleagues in the Oak Knoll Department of Otolaryngology and Maxillofacial Surgery discuss their involvement in an otitis media program for American Indians in the Southwest, beginning on page 6. (Photo by PH2 Bob Weissleder.)

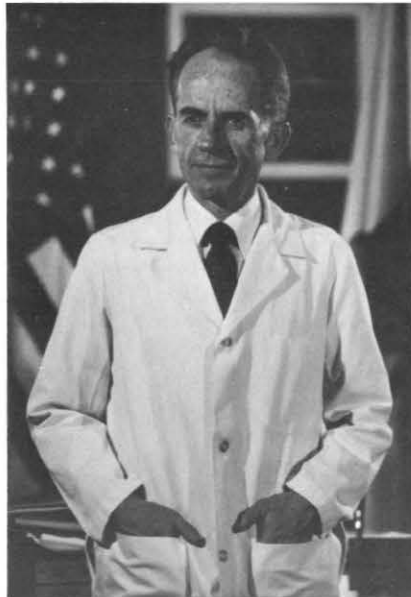
From the Surgeon General

Maintaining the Quality of Medical Care

This monthly letter affords an excellent mechanism for me to share with you my perceptions of where we are as a Medical Department and where we ought to be. It also is an excellent way for me to address issues that arise in various arenas that impact upon us in direct and often disquieting ways. I have addressed the personnel shortfall in this space before, but largely from a philosophical view. It is time to address some specific aspects of that problem.

We must not be bound by narrow parochial interests which force us to maintain facilities where they are not needed, and to build new facilities where they are not justified. We cannot put a tertiary care facility at the end of every pier. If we do not receive the resources to fulfill all our requirements, then we are going to have to make vertical cuts in the services provided. We must have the authority to close in-patient services in marginal areas if necessary, or to close selectively specific services at other facilities. To do otherwise would be deliberately accepting an unpalatable and indefensible reduction in the quality of care provided.

You are aware of the radiology problem and the steps we have had to take to provide contract radiologi-



VADM Arentzen


cal services at some facilities. For some months I have been concerned about the ability of the Medical Department to continue to provide full obstetric and gynecology services at our facilities. After a comprehensive review of the situation, it is apparent that our shortfall of obstetric/gynecology specialists this summer is severe enough to force action. It is not possible to absorb the shortage through horizontal cuts, rendering each department anemic and significantly jeopardizing our ability to provide safe, quality care.

Therefore, it has become necessary to eliminate obstetric/gynecol-

ogy services at selected Medical Department activities and redistribute the support assets to other Medical Department activities to help ameliorate the overall shortage problems. In making this decision, current workload and the availability of alternative obstetric/gynecology services either at other military activities or in the civilian community were carefully considered.

In addition to the already planned reductions at New Orleans and Key West, closure of the obstetric/gynecology services will take place at Annapolis, Quantico, Corpus Christi, and Port Hueneme. This will be phased gradually, so that present patients may be carried through to delivery and no new patients enrolled.

It is painful at any time to have to curtail services. But we must recognize that it is no longer possible to provide full services everywhere. I depend upon each of you to explain this necessity to our patients, to emphasize that it is in their best interests that we maintain quality rather than quantity of service.


W.P. ARENTZEN
Vice Admiral, Medical Corps
United States Navy

Department Rounds

Tiger Cruise Teacher

For the USS *Coral Sea* medical department staff, the 1977 Tiger Cruise brought an educational bonus: the aircraft carrier's sickbay was transformed into a floating medical school under the tutelage of Charles R. Hawes, M.D., director of the Cardiopulmonary Department at Denver Children's Hospital.

Dr. Hawes was one of 380 guests who joined *Coral Sea* in Pearl Harbor on 29 September for a seven-day cruise to the ship's homeport in Alameda, Calif. Many of the visiting "Tigers" were relatives of *Coral Sea* officers and crewmembers. Dr. Hawes, for example, was there at the urging of his son Bruce, an aviation structural mechanic attached to Fighter Squadron 191, embarked on the aircraft carrier. Other guests included fathers, sons, brothers, and a grandfather or two.

Informal. Before coming aboard, Dr. Hawes, an associate clinical professor at the University of Colorado, volunteered to conduct informal training sessions in cardiology for the ship's medical officers and corpsmen. Senior medical officer LCDR M. Hollis Tanksley (MC) quickly accepted the offer and was among the 20 medical department

members on hand for six hours of seminars.

Dr. Hawes enlivened the training with slide shows and chalkboard drawings, and demonstrated the use of a variety of medical equipment he brought along.

He paid special attention to the hospital corpsmen assigned to *Coral*

Sea. "Now more than ever you are called upon to know and do more," Dr. Hawes told them, recognizing the vital importance of their role in Navy health care delivery. "Your job has changed into what I call a 'medical associate.' As such, your responsibilities have increased."

When not teaching, Dr. Hawes joined the other guests for shipwide tours and briefings on *Coral Sea*'s various aircraft. The visitors observed a high-line conventional underway replenishment and a vertical underway replenishment operation.

Dr. Hawes received his M.D. degree in 1946 from the Oklahoma University School of Medicine. He is a member of the American Board of Pediatrics and the American Board of Pediatric Cardiology, and a fellow of the American Academy of Pediatrics and the American College of Cardiology.

—Story submitted by JOSH Bruce Jones.
Photos by PH3 Rick Lebsack.



Dr. Hawes teaches stethoscope use . . .



. . . sketches heart functions in training session . . .



...demonstrates patient care techniques

NOSC Tests Blood Pressure Monitor

At the Naval Ocean Systems Center, San Diego, work is under way on a noninvasive system to continuously monitor blood pressure.

NOSC researchers explored various approaches before selecting for further development a technique using pressure capsule tonometry. This technique shows a promising capability for continuous monitoring of arterial blood pressure in both waveform and magnitude.

Research is sponsored by the Naval Medical Research and Development Command in Bethesda, Md.

Pressure capsule. The mechanism used for blood pressure sensing in this technique is a pressure capsule tonometer—a small, air-filled chamber which has one face of flexible material. A solid-state transducer continuously measures chamber pressure; the transducer's electrical output drives circuitry which can produce the waveform and derive instantaneous numerical values of both systolic and diastolic blood pressure.

Pressure measurements are taken from the radial artery just before it crosses over the distal end of the radius. At this point the normal radial artery is superficial and held relatively captive. Also, pressure pulsations can be felt most easily with the fingertips here, and the artery does not shift under the tonometer.

The tonometer, with the flexible face down, is held in place and pressed against the artery by an encircling wrist band. Although this band applies pressure around the wrist, there are enough gaps so venous flow from the hand is not restricted. Normal circulation is apparent in the hand even after the band has been in continuous use for one hour; also, bi-directional doppler flow measurements on a number of superficial arteries in the hand

reveal no arterial occlusions.

In the first designed system, electrical signals representing arterial pressure from the tonometer are processed by a microprocessor. Using timing provided by a simultaneously acquired Lead I electrocardiogram, the microprocessor digitizes the pressure wave, identifies systolic and diastolic pressure points for each beat, displays both values digitally, and converts systolic and diastolic values to analog form for recording on a strip chart.

Because pressure variations caused by the patient's breathing may obscure trends, the microprocessor has been programmed to calculate a moving average of the last *n* beats before display or output, where *n* can be selected as 2, 4, or 8. In addition, the microprocessor uses the EKG signal to calculate beat-to-beat heart rate, which is shown on a third digital display for either an individual beat or a moving average (as is done with blood pressure measurement). All three digital displays are updated with every heartbeat regardless of the averaging interval that is selected.

Presently, the tonometer is not automatically calibrated to actual intra-arterial pressures, but this is a design goal. Although representative of the blood pressure waveform, the monitored wave by itself is not an absolute measure of blood pressure. Also, positioning the tonometer over the artery is critical for fidelity of waveshape and stability. The tonometer must be carefully placed and cannot be moved; if the wave baseline is to remain stable over any measurement period, the wrist must be immobilized.

Studies. Solutions to these problems are being sought through additional research studies. For example, research performed at the Medical School of the University of

California, San Diego, by NOSC biomedical engineers compared tonometer pressure with pressure obtained from indwelling catheters in dogs. The tonometer was located on the skin over the left femoral artery; the catheter was placed in the right femoral artery. Systolic and diastolic pressures were measured by the tonometer, which was initially scaled with the indwelling pressure measurements as a reference. The goal: to determine if, once set, the pressure wave produced by the tonometer tracked the pressure wave of the indwelling catheter.



Navy researchers work on blood pressure capsule tonometer recordings

Scaling was not changed as a number of cardiovascular-altering drugs were administered. Epinephrine, norepinephrine, isoproterenol, and acetylcholine were used to ensure a wide range of pressure waves.

The concentrations used for the drugs resulted in marked pressure wave alterations. For large pressure variations, the tonometer values were not always proportional to catheter values, although they always followed the direction of the changes. For small changes, there was close correlation between the tonometer and catheter values.

Figure 1 shows catheter pressure waveform, tonometer pressure waveform, and derived systolic and diastolic pressures for the dog when no drugs were administered. Systolic and diastolic pressures indicated by the tonometer can be seen to closely track those of the catheter even through respiratory pressure dips. Also, the tonometer wave is closely in phase with the catheter wave even though the frequency response of the tonometer is con-

siderably below that of the catheter. (Calculations show the tonometer to have an acceptable response up to 10 Hz.)

Figure 2 is a 100-second recording of pressure data with systolic and diastolic pressures when drugs were administered. The dog was recovering from one drug (acetylcholine) up to the point indicated by the arrow, at which time a second drug (a bolus of isoproterenol) was injected.

Volunteers. In addition, comparative measurements of tonometer and catheter are being carried out on human volunteers at Naval Regional Medical Center, San Diego. These volunteers are patients who already have radial artery catheters in place as a normal part of their medical treatment; no drugs are given during the tests, and the patients are placed at no additional medical risk as a result of their participation in the experiment.

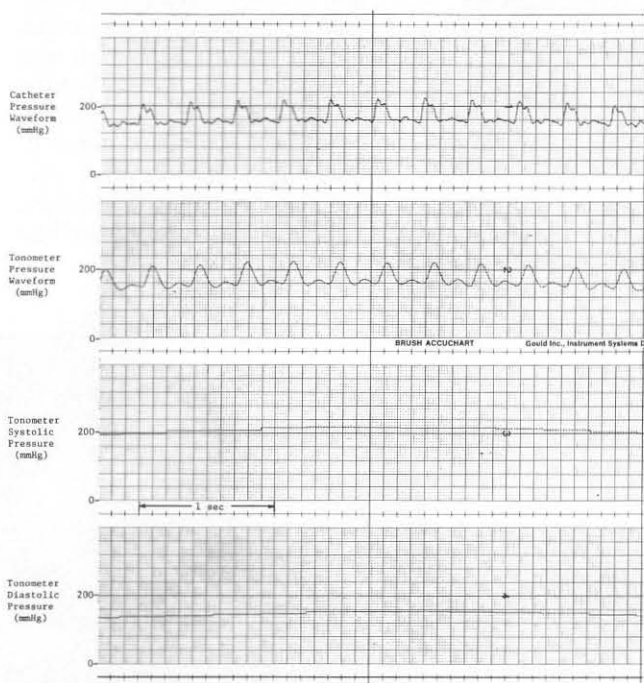


FIG. 1. Simultaneous tonometer and catheter recordings for dog without drugs. Tonometer was placed over left femoral artery; indwelling catheter was in right femoral artery. Micro-processor-derived beat-to-beat systolic and diastolic pressures are also shown.

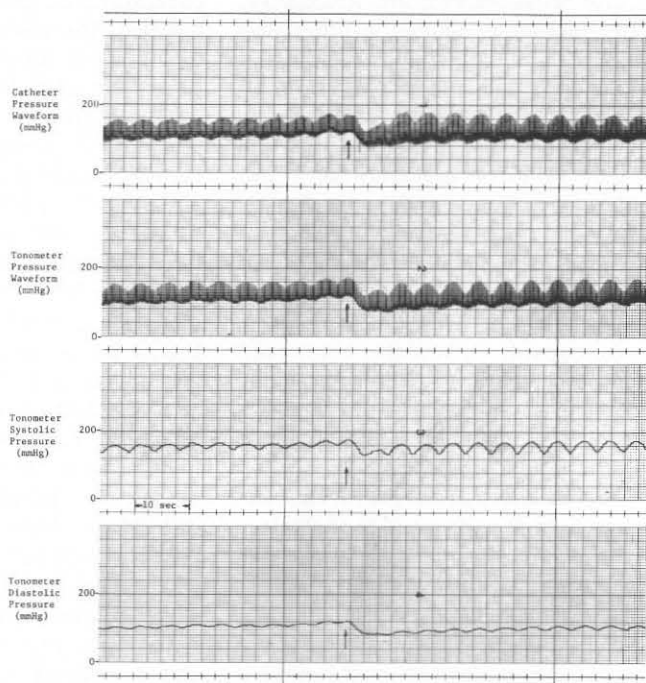


FIG. 2. Simultaneous tonometer and catheter recordings for dog with drugs. Dog was recovering from acetylcholine when isoproterenol bolus was injected at point indicated by arrow.

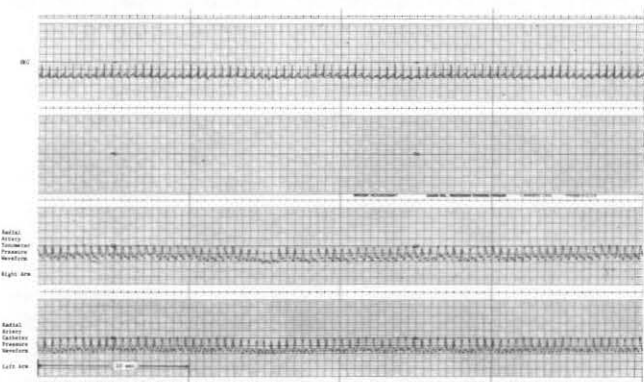


FIG. 3. Simultaneous tonometer and catheter recordings from human patient under conditions of normal cardiac activity.

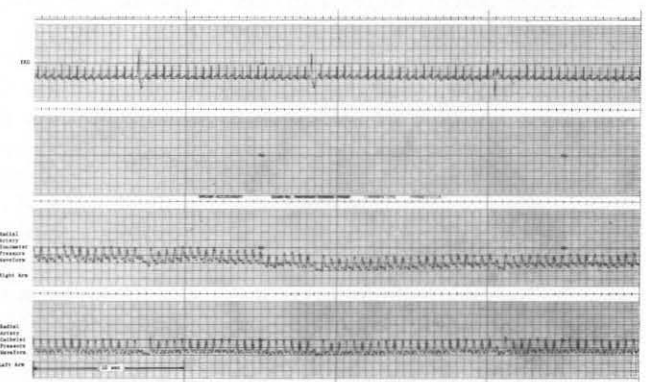


FIG. 4. Simultaneous tonometer and catheter recordings for human patient under conditions of abnormal cardiac activity.

The radial artery site opposite the catheter is used. Since the wrists are not immobilized, waveform stability is limited to short periods, generally of less than a minute.

Tonometer measurements for a human patient are shown in Figures 3 and 4. Figure 3 represents a 40-second recording during a period of normal cardiac activity. There is general agreement between the two pressure waveforms and respiratory variation can be observed in both tracings. (In this case tonometer-based and catheter-based measurements both have approximately the same band limitation of 10 Hz.)

Figure 4 records the same patient over a period of abnormal cardiac activity. Pressure wave characteristics for the individual abnormal beats as measured by the tonometer match those of the indwelling catheter. This particular result shows that even if the tonometer is not absolutely calibrated to pressure values, waveform information can be accurately obtained; it suggests that in the presence of abnormal EKG activity, the tonometer might add hemodynamic information in support of a diagnosis.

The tonometer has also been used to demonstrate pressure wave characteristics in the carotid artery and in the dorsalis pedis artery in the foot. At the carotid artery, the tonometer gives results equivalent to a standard carotid pulse tracing.

On the basis of experimentation to date, the pressure capsule tonometry approach appears sufficiently promising to warrant further development. Even if calibration and stability problems cannot be solved, the technique would still be of value as a noninvasive means of recording samples of pressure waveshape. But if the problems *can* be solved, the technique has the potential for widespread application wherever continuous monitoring of blood pressure without catheterization may be desired for patient diagnosis and treatment.

—W.T. Rasmussen, Ph.D., head, Biomedical Engineering Branch, Naval Ocean Systems Center, San Diego, Calif. 92152.

BUMED SITREP

CONSTRUCTION . . . Seven Navy medical construction projects remain scheduled for completion during Fiscal Year 1978:

- Phase II of the Environmental Health Effects Laboratory at the Naval Medical Research Institute, Bethesda. This laboratory will provide facilities for underwater research projects in pressures up to 1,500 psi and in closed systems (submersible) environments.
- A medical and dental clinic addition for the ADM Joel T. Boone Clinic at Naval Amphibious Base, Little Creek, Va. The addition will include a medical clinic for active-duty military personnel and a dental clinic with 26 dental operating rooms and 6 oral hygiene treatment rooms.
- Modernization of NRMJ Jacksonville, Fla., to upgrade clinical facilities as well as mechanical and electrical systems in the hospital.
- Replacement of the medical clinic at Sewells Point, Naval Base, Norfolk, with a consolidated clinic that will serve both the naval base and the naval air station.
- A branch dental clinic at Naval Air Station, North Island, to include 22 dental operating rooms and 5 oral hygiene treatment rooms. The new clinic will replace a substandard cantonment facility built during World War II.
- A new facility for Navy Environmental and Preventive Medicine Unit No. 5 at San Diego, also replacing a substandard WWII cantonment building.
- A branch medical and dental clinic at Naval Air Station, Brunswick, Maine, to replace a substandard WWII cantonment facility.

New construction projects authorized last August in the FY78 Military Construction Program include bachelor enlisted quarters at NRMJ Bremerton, Wash.; a new parking structure at NNMC; and steam line distribution repairs at NRMJ Portsmouth, Va.—an Energy Conservation Investment Program project.

Included in the Medical Department's proposed construction program for FY79 is a major hospital replacement project at NRMJ Camp Lejeune, N.C. A replacement dental clinic at Naval Regional Dental Center, Norfolk, Va.; a branch medical and dental clinic at The Basic School, Marine Corps Development and Education Command, Quan-

tico, Va.; an Industrial Health Clinic, Marine Corps Air Station, Cherry Point, N.C.; a replacement Biomedical Research Laboratory at Naval Medical Research Unit No. 3, Cairo, Arab Republic of Egypt; and Phase III of center redevelopment at NNMC Bethesda, Md., constitute the remainder of the proposed construction program.

IMMUNIZATION MEDIA KITS . . .

BUMED has available for distribution a limited number of free immunization media kits prepared by the Center for Disease Control. The kits contain photographs, artwork, fact sheets, and other useful material that will help Navy medical facilities inform their patients about the need for childhood immunizations. Kits may be obtained from: Editor, *U.S. Navy Medicine*, Bureau of Medicine and Surgery (Code 0010), 2300 E St. NW, Washington, D.C. 20372. One kit per facility, please.

EQUAL OPPORTUNITY . . . BUMED is looking for an officer, preferably LCDR or above, to serve with its equal opportunity specialist teams as officer-in-charge of the West Coast detachment. The selectee will attend the Defense Race Relations Institute for 11 weeks before assuming OIC responsibilities. During the OIC tour of duty, the detachment will travel to San Diego, Great Lakes, and Corpus Christi to implement Phase II of the Navy Equal Opportunity Program. Interested persons should contact LT B.J. Jones (MSC), Bureau of Medicine and Surgery, Code 354. Telephone: (Area code 202) 254-4081 or Autovon 294-4081.

FMF MEDICAL SUPPORT . . . The Medical Officer, U.S. Marine Corps, will hold the third annual "Conference of Selected Medical Department Officers of Marine Corps Commands" from 24 through 28 April 1978. The conference will focus on matters pertaining to overall medical support for the Fleet Marine Forces. Specific topics and agenda items are currently being solicited. For additional information contact the Medical Officer's Office, HQMC, at Autovon 224-1055/1537 or Commercial (202) 694-1055/1537.

NRMC Oakland

Navy-Indian Project Combats Ear Disease

In the last decade, otitis media has replaced tuberculosis as the major reportable health problem among American Indians.

Now, through the Navy-Indian Otitis Media Project, the staff of the Otolaryngology and Maxillofacial Surgery Department at Naval Regional Medical Center Oakland is helping control that problem on 13 Indian reservations throughout California, Arizona, Nevada, and Utah.

CAPT Tom Miller (MC), department chairman, remembers how the project began nearly five years ago:

"The Phoenix Indian Hospital wasn't able to care for a large backlog of otitis media patients on the seven reservations in the area. The disease was so prevalent and there were such demands for prolonged treatment, corrective surgery and rehabilitation, that the single otolaryngologist at that hospital just couldn't handle it all."

Call for help. By then Congress had appropriated funds expressly for an otitis media program, and a hospital administrator at the Indian Health Service Hospital on the Fort Apache Reservation in Whiteriver, Ariz., called NRMC Oakland for help.

"The Phoenix Area of the Indian Health Service has the task of providing medical care to the Indian population throughout the Southwest. They had asked other government health providers to help supply extra medical care to identify and treat otitis media," explains CAPT Patrick R. Burkett (MC), assistant chief of the department. "Because of the availability of our personnel, we were able to deliver services beyond what we were already providing for the military."

When the project began, two or three patients were flown each week from Whiteriver to Oakland International Airport. There they were met by an ear, nose, and throat technician who brought them to the medical center for surgery.

The other part of the project involved Oak Knoll physicians visiting Whiteriver to see Indian patients in clinics.

"There was a great need for our help," says CAPT Burkett. "In the first several clinics we held we identified up to as many as half of the Indians examined as needing treatment for chronic ear disease, either because of chronic infection or ear drum perforation—or both."

"The initial response to our ear clinics on the reservation was one of unconcern, bordering almost on distrust," CAPT Miller recalls. "The Indian has been the object of so many survey projects and short term pseudocharitable efforts, with no resulting benefit, that this reaction didn't surprise us." But, according to Dr. Miller, as the otitis media project stretched from weeks into months and finally into years, the Indians' response changed to total acceptance, warmth, and real appreciation for the efforts being made in their behalf.

On the reservation. More than 700 Whiteriver Indians have been treated since the project began. And with the help of funds from the Public Health Service, CAPT Miller, CAPT Burkett, and their colleague in the Otolaryngology and Maxillofacial Surgery Department, CAPT C. Gordon Strom (MC), have regularly conducted similar clinics at many other reservations in the Southwest.

But all surgery is performed at Oak Knoll, and weekly charter flights still bring the ailing Indians in for treatment.

"We meet the Indians at the airport and check them in at Oak Knoll for examinations and a tour of the facilities," says CAPT Strom, chief of the Otology and Pediatrics Division. "Wives' club members and others also take them on a tour of San Francisco. After surgery, they're on their way home within a week."

Surgery has ranged from a simple adenotonsillectomy to the most complicated tympanoplastic and tympanomastoid procedures.

Benefits for all. "The Phoenix area Indian Health Service provides funds for transportation, travel, equipment, and the extra personnel necessary to do the job," CAPT Strom explains. "And the program has always been conducted with the permission of our commanding officer and with the assurance that other treatment in our department wasn't held short."

The Oak Knoll otolaryngologists see the program as benefiting the Navy as well as the Indians. "You learn something different every time you do surgery for otitis media," Dr. Strom says. "Our experience with American Indians and their ear diseases has helped us care for patients from our own military community."

CAPT Burkett is particularly pleased by the improvement in the health of Indian children he sees.

"Probably the most important thing we've noticed is that the incidence of otitis media has decreased markedly with good treatment of the initial infection in the

children," he says. "Treating the disease where there isn't a perforation of the ear drum seems to cause the disease to disappear with no permanent disability."

Mini-residency. Another vital part of the program has been in-hospital training of Public Health Service physicians, nurse practitioners, and physician's assistants. Selected representatives come to NRMCOakland for one week to observe ear surgery and receive instruction in postoperative care of the patient. The goal: to enable them to care for ear disease on the reservation.

"This mini-residency in otolaryngology has been praised by the Public Health Service as one of the most valuable fringe benefits of the program," Dr. Miller reports.

Besides the otitis media project, other innovations at the Department of Otolaryngology and Maxillofacial Surgery include a regional hearing conservation program aimed at reducing the number of disabled and handicapped service members and Navy employees. In five separate courses at Oak Knoll, 76 audiometric technicians have been trained; they are now working in the region performing initial hearing tests and keeping hearing conservation records under the supervision of environmental health specialists.

"We've done a lot of new things here at Oak Knoll," says Dr. Miller, "and as a result we've built up a program that has a reputation as good as the university programs."

Dr. Burkett agrees. "We've been able to provide most of the latest developments in medical care here," he says of his work at NRMCOakland. "In our department the overall quality of care is excellent. We have a very good ratio of staff physicians to residents, which means better resident training and better patient care both here and at the outlying military clinics in the region."

—Story submitted by JO3 John Brindley. Photos by PH2 Bob Weissleder, and courtesy of *The Oak Leaf*, NRMCOakland.



Dr. Miller examines youngster at Oak Knoll's ENT clinic



Left: Little Shawn Baha is ready to go home after ear surgery at Oak Knoll, as Sharon Danford arrives. Above: Dr. Burkett at work

Education & Training

Navy ambulance drivers learn to be . . .

Masters of Defensive Driving

For many years after the driven ambulance was introduced in 1906, most ambulances were nothing more than converted funeral home hearses. The design of the hearse made it easy to transport injured patients on portable litters. Few medical supplies were carried, and only as many attendants as could squeeze into the cramped space.

Today, specially designed vehicles carrying sophisticated medical equipment serve as ambulances in most of the country's urban areas. Use of these larger, less maneuverable ambulances requires that drivers be thoroughly trained in all aspects of safe handling.

At the Naval Regional Medical Center Corpus Christi, Tex., three state troopers from the Education Section of the Texas Department of

Public Safety recently conducted a class in professional defensive driving. Thirty-five people from the hospital—including ambulance drivers, attendants, and transportation drivers—participated.

High aim. The course began with an intensive three-hour classroom session of films, lectures, and five tests. Students then went on the road to master four vehicle maneuvers designed to make them aware of the van ambulance's limitations.

In this road course, students learned how to handle a diminishing alley, a 90° right turn, an offset alley, and patient loading area maneuvering. The instructors continually reminded each driver that speed was not important, and at no time did the drivers exceed 20 miles per hour. Instead of speed they con-

centrated on driving the vehicle so skillfully that it did not hit the boundary flags or pylons placed along the course. Each driver started the course with a perfect 300 score and lost five points every time a stanchion was touched.

The first hurdle, the diminishing alley, was a test of the drivers' "high aim" driving skills. Drivers had to enter a 9-ft-wide lane bordered by stanchions which gradually reduced the lane to a width of only 7 ft. Drivers were to maintain a speed of 20 mph while driving through the 200-ft-long alley.

The right turn test challenged the drivers' breaking and distance judgment skills. Drivers had to enter a marked off lane at 20 mph, drive 50 ft, negotiate a 90° right turn, then with only 100 ft of lane remaining, increase vehicle speed back to 20 mph. From this test, drivers learned an important lesson: van ambulances cannot be driven like regular automobiles because the center of gravity is higher in an ambulance and farther away from the driver, so it takes longer to stop.

Tough test. The next maneuver, the offset alley, proved to be tough for the students, and many drivers lost points. This test simulated guiding an ambulance into an accident scene, then backing the vehicle along the same path it entered. The test was complicated by a sharp swerve in the middle of the path, which was difficult for the driver to see through the ambulance's rear window.

The final obstacle, the patient loading dock, was the most difficult of the four tests. Drivers had to guide the vehicle into a 10-ft driveway and back up from there into a simulated patient loading dock; then they had to drive out the same way they came in. This test also simulated backing an ambulance



State Trooper J.D. West conducts classroom session in defensive driving



Points off for each stanchion hit



The 90° turn is tricky



Diminishing alley tests aim



Visibility to rear is poor

into an accident area between two vehicles or buildings.

The 35 medical center personnel who took the course scored an average of 250 points.

The obstacle course helped drivers learn the limitations of their vehicles and themselves—limitations which might be corrected through training. This training can be incorporated into the hospital's program for all prospective ambulance drivers, and can be offered as

an annual refresher course. At Corpus Christi, medical center transportation personnel themselves will be able to conduct future courses.

This professional defensive driving course was conducted at no cost to the medical center thanks to the Texas Department of Public Safety and the men who administered the course: State Troopers James I. Anderson, William M. Smith, and J.D. "Chick" West.

Landing Force Medical Staff Planning

The Landing Force Training Command, Pacific (LFTComPac), located aboard the Naval Amphibious Base, Coronado, near San Diego, Calif., sponsors instruction and training in the doctrine, tactics, and techniques of amphibious operations, with emphasis on landing force matters.

Included in the training is a five-day landing force medical staff planning course. Its purpose: to train health service officers and selected medical department petty officers and noncommissioned officers of the U.S. and allied armed forces in the principles and techniques of medical staff planning and landing force medical services in amphibious operations.

The course emphasizes the considerations and responsibilities of the landing force commander and amphibious task force commander in providing medical support. After completing this training, students should be able to prepare medical estimates, casualty estimates, and medical annexes and plans.

The course specifically addresses the following areas: amphibious task force organization and relationships; landing categories and serialization; intelligence planning; civil affairs organization and functions;

shore party and helicopter support team operations; medical battalion communications; embarkation planning considerations; amphibious logistics; logistic control agencies; administrative-logistics plans; and medical staff planning problems. The training involves classroom work only; practical field training is not included.

Training in landing force medical staff planning is conducted through:

- resident courses, "as requested," at the Naval Amphibious Base, Coronado.

- mobile training team courses—provided the requesting command can furnish the areas, classrooms, and facilities, and defray all attendant temporary additional duty costs of team personnel and transportation charges for instructional material.

- unit training, conducted in accordance with arrangements determined during planning conferences and discussions (training of major units and special groups is conducted by LFTComPac on an "as requested" basis).

Approximately 350 Navy Medical Department and Marine Corps members attended the courses during 1976 and 1977.

—LCDR R.W. Barnhill (MSC).

Highlights

First National Conference on Military Family Research

Edna J. Hunter, Ph.D.

A conference on current trends and directions in military family research was held 1-3 Sept 1977 in San Diego. Joint hosts for this conference were the Family Studies Branch of the Naval Health Research Center, San Diego, and the Naval Postgraduate School, Monterey, Calif. Funding was provided by the Office of Naval Research.

The conference gave researchers and Navy operational decision-makers an opportunity to examine the entire spectrum of military family research—what has been done, what is being done now, and the directions such research should pursue in the future. In attendance were representatives from all branches of the military service as well as the academic community. Participants and attendees included operational, research, and service delivery personnel. The conference was evidence of growing interest in the military family; it also demonstrated that top planners now realize that while the military organization has an impact on family members, the family also impacts upon accomplishment of the military mission.

Keynote speakers representing the three military services were VADM James D. Watkins, USN, Chief of the Bureau of Naval Personnel; BGEN John H. Johns, USA, Chief of the (Army) Human Resources Directorate; and BGEN Richard Carr, USAF, Deputy Chief of (U.S. Air Force) Chaplains.

The opening plenary session was introduced by RADM D. Earl Brown, MC, USN, commanding officer of Naval Regional Medical Center San Diego; it was closed by RADM John J. O'Connor, CHC, USN, Chief of Navy Chaplains. Principal speakers on the opening day included Professor Henry B. Biller of the University of Rhode Island, and retired ADM Elmo R. Zumwalt, Jr., former Chief of Naval Operations.

Edna J. Hunter, Ph.D., head of the Family Studies Branch, Naval Health Research Center, was conference general chairman. D. Stephen Nice, Ph.D., also of the Naval Health Research Center, served as program chairman, and Professor C. Brooklyn Derr of the Naval Postgraduate School was administrative chairman.

Until recently, military family research has been a much-neglected area of concern among military planners, even though the research that has been carried out usually pointed to a definite relationship between family factors and the job satisfaction, performance, and retention of service members.

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Photographs courtesy of Virginia Siegfried, *Wifeline*.

The all-volunteer service, the changing roles of men and women in society, and the integration of larger numbers of women into military service have increased interest in the family's impact upon the military mission.

In his keynote address, VADM Watkins observed that the military services have not been very sophisticated about measuring the value or impact of family support efforts. "Lack of solid data has not only made it difficult to define our

requirements, but has also made it difficult to defend resulting programs—particularly those in competition with programs more obviously related to readiness," he said.

As an example, VADM Watkins noted that of the total Department of Defense research and development budget, for every dollar allocated to hardware programs only half of 1% goes into personnel research. Yet operational planners are constantly confronted with the fact that military manpower accounts for 55% of the Defense budget annually—an index cited as excessive even though industry nationally spends 70% of its budget for labor and related costs. Nonetheless, when budget time rolls around each year, planners, analysts, and civilian military leaders focus on hardware-oriented military capabilities and the readiness of the services to carry out their combat missions, VADM Watkins said; budget items not directly coupled with readiness are often vulnerable to curtailment.

ADM Zumwalt, drawing upon his vast naval experience, said that most Line officers have used some form of research to try to understand the problems of the people under their command. However, in past years the military commander usually was his own research analyst, and "poor man's research" was about the only type available to him. Unfortunately, as BGEN Johns pointed out, "good common sense" sometimes led to actions that were not always the best.

VADM Watkins affirmed that, on the other hand, "good, solid, well-constructed and properly coordinated research . . . will give us the

data we need to defend our programs against the most detailed and objective scrutiny." But, he said, most reports of past research are filed away on "dusty shelves."

"Few of these [reports] have ever been reviewed by people who had the power to change policies and programs," VADM Watkins said. "Yet people who can influence policies directly or indirectly affect military families in hundreds of ways." He pointed out that this situation is changing, and said that the 400 persons attending the conference were positive evidence of the interest in that change.

OPERATIONAL PAYOFFS

Too often research studies have been designed solely to serve academic pursuits, whereas the needs of military planners are basically pragmatic. Conference speakers repeatedly emphasized the need to translate research findings into meaningful, applicable, and helpful information for operations personnel. VADM Watkins underlined this need saying, "While theory is certainly important in the development of a study, hard data must support the application of the results in today's world While opinions are necessary in forming conclusions, the budget analysts in the Congress want to see measurable payoff."

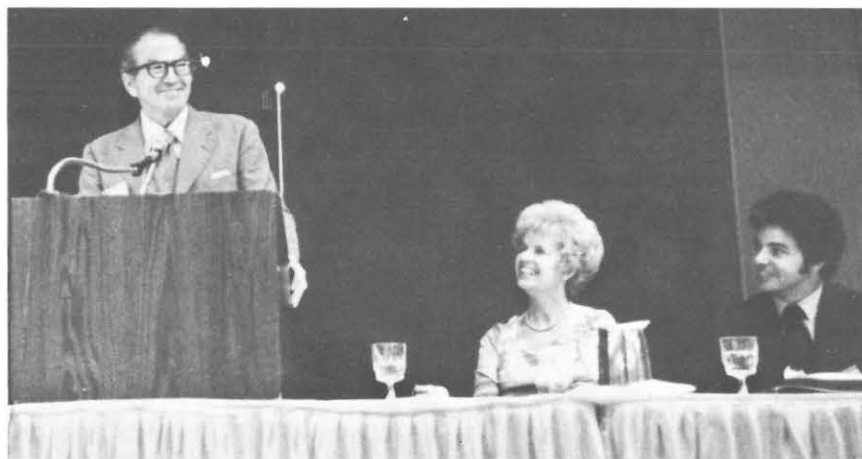
With the end of the draft and the loss of unlimited manpower resources, the need to use information derived from research to increase operational effectiveness has become even more acute than it was in the past. A host of questions still challenge researchers: Which support systems best meet the military family's needs? Are new social or financial supports required? Are there perhaps different supports required at transitional points in the family's developmental life cycle—for example, when the first child arrives or when the military member retires from active duty? Do the programs set up to support families really do the job? Often Navy plan-

ners don't know the answers to these questions because Navy programs haven't been properly evaluated.

Family practice clinics are now beginning to assess family functioning as a routine part of family health care. More health care providers now realize that family crises, life events and physical health are related, and all affect the demand for health care services. One direct payoff of research, then would be to limit the increased demand for health care services that usually occurs among family members immediately after the father deploys. Adequate support systems that

is indeed a problem to the Surgeon General and to the Assistant Secretary of Defense for Health Affairs. . . . Our interests are in developing more information about consumer health behaviors—how people use health facilities—as well as the effect of stresses on health, both for family members and service members."

Research is needed, for example, to find out if assigning women to sea duty or combat assignments increases, decreases, or has no impact upon retention, performance, and family satisfaction with the military lifestyle. ADM Zumwalt said he believes strongly that women at sea



ADM Zumwalt scores a point, while Drs. Hunter and Biller listen appreciatively

effectively meet the crises that accompany family separations could perhaps considerably reduce the family's demand for expensive medical services.

CAPT Paul D. Nelson (MC), of the Naval Medical Research and Development Command, told conference participants that his organization is interested in knowing "how families prepare for separation, how they cope with it when under way, and how the family comes back together again, particularly from the point of view of health needs."

"The consumer market for health needs in the military is enormous, and though more and more of this is going out via CHAMPUS to civilian providers, it still costs money to the taxpayers," CAPT Nelson said. "It

"will be a good thing because of the increased opportunity that [service wives] will have to have their husbands ashore." Likewise, VADM Watkins said he believes "bringing women into the Navy will one day mature the male in the Navy and make him not only a better serviceman but also a better citizen and a more all-round individual—one that will be more balanced and more accepted by society."

Often old myths are reflected in research assumptions. One example, reported by Joseph Ward, Ph.D., was a proposed Army Research Institute project to look at the effect of women on unit performance "degradation." In other words, there was an implicit assumption in the statement of the problem presented for study that

performance would decrease as more women were added to the unit. Dr. Ward reported that, contrary to the implicit assumption, actual research results showed no degradation in unit performance.

Research can supply answers for many questions: What effect do women leaders have on other women and on men? What types of attitudes do men display? How do women leaders affect the work environment? What intervention strategies help prevent degradation of unit performance and family dissatisfaction?

Payoffs in the form of increased operational effectiveness can also accrue from researching other than male/female dichotomies. For example, military missions could perhaps be performed more efficiently if we knew more about attitudinal factors in dichotomies such as officer/enlisted, senior officer/junior officer, Black/White, and others.

What are the correlations between job satisfaction, performance, retention, and various family factors? What is the relationship between leadership styles and family factors? ADM Zumwalt reviewed for conference attendees some of the steps he had taken as Chief of Naval Operations to improve retention by reducing the length of family separations: finding more shore jobs for men with critical sea ratings; arranging overseas charter flights for dependents; establishing homeporting programs overseas; and creating exchange billets with foreign navies so more U.S. Navy members could be placed in exciting and challenging overseas areas. ADM Zumwalt cautioned, however, that answers which were appropriate yesterday may not be correct for tomorrow's questions. Evaluative research must be an ongoing process.

STRESSFUL ENVIRONMENT

Only in recent years have military decision-makers shown substantial interest in the military family. Nonetheless, as RADM Brown

pointed out, "The more we study and learn about the military family, the better we will understand how the successful military family manages to coalesce the goals of the family with the goals of the military. . . . The military member's ability to function to capacity, to be happy in his role at work, and to grow in the military environment is dependent upon how well he or she and his or her family are able to integrate the family's goals with the military."

The ever-present threat of family disruption through separation and the possibility of high-risk assignments and armed conflict create a constant environment of stress.



Dr. Hunter and Dr. Nice brief press on conference

What effect does so stressful an environment have on families? What can be done to modify undesirable effects? According to VADM Watkins, "We need answers to a whole range of questions, and we are just beginning to learn what questions we should have been asking."

BGEN Carr stated his firm belief that, "If we convince ourselves that there is a direct correlation between what happens to a family in a stressful environment such as this and the actual performance or productivity of the military member . . . we can turn funding around and get it distributed into areas where we desperately need it—that is, into human behavioral research and programs to meet the needs of our families. . . . When I can convince a commanding officer and a Congressman that if they don't do something about the stress environ-

ment of the military member, the actual deterrent and defense posture of this nation is affected, then I'm going to get the money to do the research."

The military organization is changing just as the family institution—both in the military and in the civilian community—is changing. One important change is increasing numbers of married military personnel, especially within enlisted ranks. BGEN Johns asked, "What are we going to do with all the barracks that we've built for soldiers to live in? We could probably convert them into apartment houses. We're spending hundreds of millions of

dollars for barracks with rooms designed to accommodate three persons when we may find in the near future that we should have allowed for only one or two persons per room because most of the junior enlisted personnel are married and living in trailers." Also, research can perhaps solve some problems of married enlisted men and women who live day after day on the threshold of financial calamity.

With changing policy we now have many single-parent families in the military—some headed by women, some by men. Here, too, are questions which can be answered through research: Do we need different support systems? For example, do we need 24-hour child care facilities?

With changing societal norms and changing roles for both men and women come variations in mari-

tal modes. We need to know more about the special problems of these nontraditional marriages and their relation to accomplishment of the military mission. We need to know how such marriages affect children. Is abuse more prevalent in the non-traditional family?

Perhaps the major change in the traditional military family has been brought about by increasing numbers of career servicewomen. With the servicewomen come new problems: the impact of male/female attitudes concerning women in non-traditional jobs; pregnant service personnel; families with "dependent" husbands; and problems unique to families in which the man and women both have military careers—e.g., crises at reassignment and wives outranking husbands.

Research already has shown that servicewomen lose less work time, have higher qualification scores, and cause fewer disciplinary problems than men. But, according to BGEN Johns, "What we really should be looking at in research is the cultural aspect—the wide cultural differences between women and men." Professor Constantina Safilios-Rothschild, a consultant to the U.S. Coast Guard Academy, suggested that perhaps we should look at how *men* are integrated into a military organization which has career women service personnel, instead of vice versa.

"Families experience an almost curvilinear path from high marital satisfaction at the beginning of marriage, but have no place to go but down for several years of the child-rearing period," reported Regents Professor Reuben Hill, currently examining family life span development at the University of Utah. "What the family life span or career of military families looks like where they remain with the service over the life span would be fascinating to bare, because many of the problems that are identified may actually be developmental problems rather than problems engendered by the military. That is, the military merely exacerbates but may not be

responsible for many of the critical chaotic experiences of growing up with children and growing out and disengaging from one's spouse in the process."

Military research can perhaps draw on such theories already developed in the field of family research within the academic community.

Whatever direction military family research takes, the need to translate research findings for clinicians and operations personnel remains constant. Furthermore, it was evident from conference participants' comments that there must be a continual check between clinical assessment and empirical measurement to make certain that "good common sense" doesn't lead researchers in wrong directions or down blind alleys.

CONCLUSIONS

Presentations at the three-day Conference on Military Family Research showed that the factors which used to make the military community unique, such as prolonged family separation and frequent moves, are becoming more apparent in the civilian sector, too. Conference attendees soon realized that studies of military families have wide applicability in the civilian community, and vice versa.

Presentations also pointed up the fact that it is much more difficult for the military organization to compete with the family than it has been in the past. Thus, there is a greater need for research to delineate how the family can be made to function more effectively in support of the military organization. At the same time, we must discover how the military can contribute to the family "mission." A balance must be achieved between health-care delivery services and other family support programs and military family research.

Many questions about the changing times and the changing military were raised. One example: Do the new marriage relationships (com-

mitted, whether legalized or not) which emphasize family loyalty and expectations of interpersonal closeness sustain rather than threaten military functioning? Research can perhaps give us the answer.

Although military family research has become a valid area of study, ADM Zumwalt cautioned that research must be repeated and ongoing in order to measure the impact of changing times and environments on the Navy family. We cannot otherwise know whether the solutions of the 1970's are applicable to the 1980's with regard to specific programs or policies. Today, attitudes towards the family as an institution are ambivalent both in civilian and military settings; it has not yet been decided whether the family is an invaluable morale agent well worth the expenditures and emotional support it needs to survive.

Among the many recommendations resulting from the conference were:

- Develop a better system for accessing reports based on military family research. Such a system would enable research findings to reach the people who can make practical use of the new information. One suggestion: a continually updated computerized bibliography of military family research publications.
- Increase liaison between military and civilian communities and between researchers and caregivers. Thus, a second Conference on Military Family Research should be held in two or three years. Perhaps a conference devoted to health care services essential to meet families' needs could be held in the interim.
- Improve dissemination of research results through a tri-service military family research journal or newsletter.
- Encourage tri-service efforts in military family research to prevent duplication. Establishment of a Center for the Study of the Military Family, with staff and funding provided by all three military services, should be considered.

Reserve

New Wrinkle for Reserve Training

Time was when Naval Reservists of G-5 Mobile Hospital 118 could look forward to spending their active duty for training period learning how to augment their regular medical counterparts.

Not any more.

As part of a new concept in the use of Reserve medical forces, the G-5 hospital unit is now designed for stand alone capability and assignment to Marine field operations in the event of mobilization.

For unit members this new wrinkle in Reserve use meant wrinkles in brows and clothes, too. Not only would ACDUTRA now be spent learning new medical support procedures, but members would also take to the fields for overnight exercises.

March in step. The unit cruise was held last year at Marine Corps Base, Quantico, Va. There members joined in parts of Marine training and worked in Naval Hospital Quantico and its outlying clinics at Mann Hall, Marine Officer Candidate School, and Camp Upshur.

At Camp Upshur, unit members observed platoon leaders class

training exercises and discussed the medical requirements attendant to such training. Then it was off on an overnigher. Reserve nurses, too, with packs on back, rode the helicopters and field ambulances and marched in step with the rest of the unit.

In the more familiar territory of the hospital and clinic, unit members conducted sick call and helped process physical examinations for officer candidate programs. Nurses received training at the hospital and rotated through the various nursing services.

The G-5 Mobile Hospital 118 was formed in March 1977. It is attached to Readiness Command Region 18 and is part of the U.S. Naval and Marine Corps Training Center in St. Louis, Mo. Commanding officer is CAPT George A. Brennan (MC).

The two-week tour at Quantico gave unit officers a chance to meet with representatives from the Bureau of Medicine and Surgery, and the Marine Corps. These meetings helped to refine the concept of Marine Corps support and to determine the course of future training.

—Story submitted by LCDR Larry Peery, MSC, USNR-R. Photographs by LCDR Clyde Miener, MSC, USNR-R.



HM1 Berry gets mosquito trap duty



LT Pat Wilson doesn't miss a step heading for

U.S. Navy Medicine



Reservists check in at Camp Upshur Clinic



Some walk and some ride when Reservists take to the fields



helicopter at Camp Upshur



HM2 Weber checks audiometer at Mann Hall Clinic



Field exercises get under way



Reserve duty means training in hospital and ambulance

Scholars' Scuttlebutt

Summer's Coming (and so is ACDUTRA)

This article has been written primarily for students in the Armed Forces Health Professions Scholarship Program (AFHPSP), but much of the information concerning travel and per diem applies to all Navy students on funded active duty for training (ACDUTRA) orders. We hope, through this article, to offer you some insight into ACDUTRA travel and monetary policies, although we realize we cannot address all situations you may run into while on ACDUTRA. Remember, the monetary amounts we cite are approximate, and travel regulations continually change. Any conflict between the information in this article and local command payment policies is resolved by the command's policies.

Students in the Armed Forces Health Professions Scholarship Program must perform 45 days' ACDUTRA in paygrade O-1 each year. ACDUTRA involves budgetary funding and is partially controlled by the federal fiscal year (1 October-30 September). You may not receive more than one ACDUTRA period during one fiscal year.

After you receive your ACDUTRA orders, follow all directions carefully. You must report to the address (or addresses) shown on or before the specified times and dates. Your 45 days of ACDUTRA includes travel time. Authorized travel time may not exceed 24 hours at the beginning and at the end of the ACDUTRA period. If you live farther than normal commuting distance from your ACDUTRA duty station, the day before your reporting date is counted as a day of travel, as is the day of detachment. If you receive orders to a duty station that is more than one day's driving distance from where you live, you should use commercial air transportation unless you wish to travel on your own time. If you do elect to travel on your own time, you are not considered to be on active duty more than 24 hours before the reporting time specified in your

orders and 24 hours after the time you are detached. Thus you are not protected under active-duty medical, death, or insurance benefits.

If you are reporting to Officer Indoctrination School in Newport, you will not be able to travel on your own time since you will be ordered to an intermediate command—as explained later in this article.

Your ACDUTRA orders will cite the amount of money set aside for pay, travel, per diem, and uniform allowances. The amounts shown for travel and per diem are maximum estimates. You will only be reimbursed for whatever amounts are supported by the travel claim you submit when you report to your duty station. This reimbursement will vary depending on how you travel, how far you travel, and the avail-

ability of government messing and berthing facilities. If bachelor officers' quarters (BOQ) are available, you must either use them or secure lodging at your own expense. You are expected to make BOQ reservations approximately four weeks in advance, by writing to the BOQ officer of the command to which you are ordered.

The amount for pay cited in your orders includes basic allowance for quarters (BAQ) and subsistence. BAQ at the O-1 level is \$193.80 a month for married officers, and \$148.80 a month for single officers. Subsistence amounts to \$59.53 a month for all personnel. Single officers lose their basic allowance for quarters if they reside in the BOQ, but they still receive a "partial rate" of \$13.20 per month. Married officers do not lose their basic allowance if they reside in the BOQ.

The following information should help you plan your expenses:

- If you travel by private automobile you will receive 7¢ per mile, if you also receive per diem. But you will receive per diem only if no government quarters and/or no government messing is available. You will receive 10¢ per mile if both government quarters and messing are available. Travel miles are based on official government distance tables. There is no reimbursement for meals when you travel by private automobile.
- If you travel by commercial transportation, save all air, train, bus, and taxi receipts to support your claim. An allowance will be paid for the meals you take while you are traveling commercially. There's no



Government berthing is always available at Officer Indoctrination School, Newport

necessity to save meal receipts.

- If both government messing and berthing are available, you will receive *no* per diem reimbursement, even though there will be a daily BOQ service charge at most duty stations. The BOQ service charge varies since it is set by each command. It has been known to range from \$1.50 to \$2.50 a day, but could go higher.

- Government messing and berthing are always available for students at OIS, and at this command only there is no BOQ service charge. If you are not drawing per diem, Navy-wide government messing will cost about 95¢ for breakfast, \$1.50 for the noon meal, and \$1.50 for the evening meal. Meal rates are higher if you are drawing per diem.

- You must reside in the BOQ if space is available. However, if neither government berthing nor messing is available, you will receive approximately \$16 a day for meals. Be sure to save your itemized lodging receipts. Per diem reimbursement for meals and lodging together usually cannot exceed \$35, although in a few designated areas the amount is higher. In the Washington, D.C., area, for example, the limit is \$50.

- If government messing but not berthing is available, you will usually receive \$9.85 a day plus the average cost of your lodging.

- If government berthing but not messing is available, you will receive approximately \$16 a day for meals. Also, in this situation only, you *will* be reimbursed for BOQ service charges.

- If you are ordered to a duty station within commuting distance from your home, you will receive no travel allowance and no per diem.

- The time at which you are paid your travel allowance and per diem will vary from one duty station to another. While travel will probably not be paid until you return home, a portion of per diem is sometimes advanced when you report aboard, especially if you must secure commercial lodging. The initial uniform allowance is paid within two to three

weeks after you report to OIS at Newport, but not until well after you complete ACDUTRA at any other duty station.

If you are ordered to OIS and live so far away that you cannot travel there by private conveyance within 24 hours, travel by commercial air transportation will be necessary. You are cautioned against trying to drive excessively long distances that could jeopardize your safe and punctual arrival.

Before you report to Newport you must first be ordered to a Naval Reserve Center near your home for three days, since the Newport training lasts only 40 days and school officials will not allow early reporting. You must physically report to and leave from this "intermediate" Naval Reserve Center duty station at the time and date stated in your orders. Officials at the Center will endorse your orders when you arrive and when you depart. Because of this policy, many of you will find there is no way you can travel to Newport on your own time, and you will have to use commercial air travel, like it or not.

While on ACDUTRA you are entitled to active-duty medical benefits and to Servicemen's Group Life Insurance (SGLI) of \$20,000, for which \$3.40 a month will be automatically deducted from your ACDUTRA pay along with federal income tax and FICA (Social Security) withholding.

The medical benefits have broad implications. One of the benefits concerns dependent care under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). You should be aware that the Naval Health Sciences Education and Training Command will not force ACDUTRA orders to coincide with elective or planned hospitalization of dependents—including maternity care benefits under CHAMPUS.

ACDUTRA is assigned during summer vacation break periods whenever possible. You will receive your orders approximately 30 to 60 days before your reporting date. To be on the safe side, don't make any plans for your vacation months until you have the exact dates of your active duty for training.

Where Are the Ensigns?

Which school has the greatest number of Navy-sponsored students in the health professions? It's Georgetown University in Washington, D.C., with a total of 81. Navy-sponsored medical, dental and Medical Service Corps students are also in evidence at the following schools:

University of Tennessee
Virginia Commonwealth University
University of Miami
George Washington University
Indiana University
University of Pittsburgh
Ohio State University
Georgia School of Medicine
St. Louis University
University of Pennsylvania
Emory University
Tufts University
University of Maryland
University of Washington

University of Alabama
University of Iowa
University of Texas, San Antonio
Temple University
University of Virginia
Medical University of South Carolina
Tulane University
Case Western Reserve University
Creighton University
Jefferson Medical College, Philadelphia, Pa.
University of Florida, Gainesville
New Jersey College of Medicine and Dentistry
Northwestern University Medical School
University of Mississippi
Boston University
College of Osteopathic Medicine and Surgery, Des Moines, Iowa
Louisiana State University, New Orleans
Meharry Medical College School of Medicine, Nashville, Tenn.
New York Medical College, N.Y.C.
University of Illinois
University of Southern Florida
University of Southern California, Los Angeles

Policy

Instructions and Directives

Nonavailability statements

All naval medical facilities with inpatient capability should continue submitting monthly reports to BUMED (Code 733) on the number of nonavailability statements (DD Form 1251) issued. Reporting procedures are set forth in BUMED Instruction 6322.12A of 15 Nov 1977.

Dispensing prescription spectacles

Prescription spectacles sometimes are not delivered to the patient for whom they were ordered because of administrative error, transfer or separation of the patient, or other reasons. Patients may then have to order duplicate spectacles and undergo a repeat visual exam.

To avoid this waste of time and materials, Navy clinics shall deliver daily spectacle orders to optical laboratories or service units. Clinics and laboratories shall use the fastest means to deliver spectacles.

Clinics shall dispense spectacles promptly to patients. If a patient has been transferred, spectacles shall be forwarded immediately to the new duty station. Spectacles that cannot be delivered should be returned to the servicing optical laboratory or service unit along with DD Form 771/771-1 and a statement explaining why they are being returned.—BUMED Notice 6810 of 16 Nov 1977.

Daily Dental Service Record

A revised individual dental officer data collection record (NAVMED 6620/1) has been developed. The new standardized form will document information about the number of dental procedures provided by each dental officer and other dental health care providers. The NAVMED 6620/1 will become the basis for a historical record of all patients treated within a dental facility.

The revised forms shall be used at all Navy dental treatment facilities and shall be completed daily by each dental health care provider. Completed forms shall be retained at the facility for at least two years. Data collected shall be used to prepare quarterly dental service reports.—BUMED Notice 6620 of 28 Nov 1977.

Uncollectible accounts

The number of accounts receivable being written off at naval medical facilities or referred to BUMED for further collection action is increasing. Medical facilities must take immediate action to strengthen procedures for collecting these accounts and minimizing writeoffs. Specifically, existing procedures will be reviewed to

ensure compliance with the *Financial Management Handbook* (NAVMED P-5020).

Payment in full shall be requested from pay patients on the day they are discharged. If payment is not received, the patient or sponsor will be given a statement of charges. Arrangements can be made for monthly payments, particularly when large amounts are due. If such payments are not made, courteous but increasingly forceful correspondence shall be sent at 30-, 60-, and 90-day intervals with the objective of securing the unpaid amount.

By far the largest dollar amount of accounts written off as uncollectible are those of CHNI (civilian humanitarian nonindigent) patients who are charged the full rate of \$206 a day. CHNI patients not covered by insurance usually have no way to pay their bill and the charges are eventually written off after collection efforts prove futile.

A patient's eligibility for medical care should be determined promptly. Patients who claim but cannot prove eligibility should be admitted but should be required to sign a certification of eligibility and informed that proper proof of eligibility must be provided by the second working day after their admission. Patients who refuse to sign such certification will be denied admission except in emergencies.

Patients determined to be ineligible for government-sponsored care shall be informed immediately that their status is changed to CHNI and that they will be required to pay the full reimbursable rate. The number of CHNI sick days at a Navy facility will be minimized by discharging or transferring such patients to other hospitals as soon as their condition permits.

U.S. citizen civilian government employees at overseas activities are now charged the full reimbursable rate for hospitalization. While most of these patients depend on insurance carriers to cover their bills, the insurance companies routinely review hospital admissions and refuse to pay when inpatient care was obviously not warranted. When the hospital bill is large, patients usually await settlement of their claim before remitting payment; if the insurance settlement is subsequently denied, the account is very likely to be uncollectible. Therefore, the need for admission must be thoroughly considered before a U.S. employee or the dependent of such an employee enters the hospital. If good medical practice dictates that the problem can be handled on an outpatient basis, the patient should not be admitted.

When a dependent's hospital stay will be prolonged, the sponsor should be contacted and tactfully informed that periodic payments can be made during the period of hospitalization. Also, every pay patient should be informed in writing exactly what the per diem charges will be. Reading and signing such notification should be part of the admission routine. The signed notification should then be forwarded to the collection agent.—BUMED Notice 6322 of 2 Dec 1977.



LCDR Alvarez: Worth waiting for

NAVMED Newsmakers

LCDR **Rosa Alvarez** (MC) knows anything worth having is worth waiting for. But even she, when she applied in 1963 to leave her native Cuba, couldn't imagine it would take eight years to receive permission. In the meantime she set up a private pediatric practice in Havana and perfected the English she began learning in grade school. Admitted to the U.S. in 1971, she successfully completed the written test required of all foreign-trained physicians and went on to become board-qualified in pediatrics. "I could have established my own practice," Dr. Alvarez says, "but I felt I owed the U.S. more. This country has done so much for my family. I felt a need to repay America's kindness and hospitality. It seemed to me that the country needed doctors more in the military than they did in private practice, so I applied for a commission in the Navy and was accepted." Dr. Alvarez now brings an international touch to the branch clinic at Mayport Naval Station, Fla.

"This is something I always wanted to do," HM3 **Ivory Hopkins** says of his work as a medical laboratory technician at NRMC San Diego. But there were plenty of detours. After high school, HM3 Hopkins



HM3 Hopkins: Good feeling

worked on the wards of Lafayette (La.) Charity Hospital before joining the Navy in 1972. He hoped for a career in health care, but instead was assigned as a deck seaman. "I must have put in a request chit every week asking to go to Hospital Corps School," he remembers. "Eventually I had an interview with a physician who recognized my potential and helped me get accepted at the School." After his training, he spent a year in general hospital corpsman duties before moving into the medical laboratory technician specialty. Now, in support of the Pacific Fleet, he spends hours each



CAPT Ballard wears 1918 uniform

day searching out abnormalities in blood and urine samples. "We come across mononucleosis and hepatitis often," he says, "but it really gives you a good feeling to spot something like leukemia and know that your early detection may help save a sailor's life."

CAPT **Gerald Ballard** (DC) is looking for a pearl-handled dental instrument kit—the kind his great-great-grandfather might have used, if his great-great-grandfather had been a dentist. Purpose of search: to add this treasure from the 1820-1850 era of dentistry to a growing collection that includes an 1893 foot-powered dental drill, a turn-of-the-century dental console with marble front, and a 1918 Dental Corps uniform. Finding room for all this in the Ballard home isn't easy. The captain fears the day he will have to take his 1770 naval cutlass out of its leather case and do battle with son Brian's encroaching collection of old fire arms, helmets, swords, daggers, and gas masks.

Notes & Announcements

CONTINUING EDUCATION FOR NAVY NURSES

The Naval Health Sciences Education and Training Command will sponsor the following continuing education course for Navy nurses:

Problem Oriented Records and Nursing Audit (18 contact hours)
5-7 June 1978 New London, Conn.

Participants will learn the components of the problem-oriented system and the basic principles of problem-oriented medical records and audit. Practice will be given in developing problem lists, writing progress notes in the 'SOAP' format, and applying principles of audit using the problem-oriented system.

The course is open to Nurse Corps officers not currently assigned to an overseas billet. However, nurses assigned to Argentina, Newfoundland; Bermuda; Guantanamo Bay, Cuba; Keflavik, Iceland; and Roosevelt Roads, Puerto Rico, who have served at least six months on active duty, may apply. The course is also open on a space-available basis to Nurse Corps officers of the inactive Reserve.

Nurse Corps officers wishing to attend the course should apply to the Naval Health Sciences Education and Training Command (Code 7), National Naval Medical Center, Bethesda, Md. 20014, following procedures set forth in the BUMED Instruction 1520.8 series. Applications should be submitted several weeks before a course begins.

AFIP'S ANNUAL LECTURES SCHEDULED FOR JUNE

The 18th Annual Lectures sponsored by the Armed Forces Institute of Pathology (AFIP) will be held 5-9 June 1978, at the Sheraton Motor Hotel, Silver Spring, Md.

Course content will center on a review of recent advances and information in anatomic pathology (and clinical pathologic methods as they apply to pathology) involving the various organs and body systems. Topics include common pitfalls in diagnosis; review of unusual cases and statistical data; review of articles published by staff members; new advances in histochemical, bacteriological, biochemical, immunological, and toxicological methods in the daily practices of pathology.

Applicants should be members of the Medical Corps of the Armed Forces or other Federal services who are board eligible or certified in pathology. Applications from qualified civilians will be considered on a space-available basis. Requests for course reservation should be received by the AFIP on or before 8 May 1978. Please include the following information: (1) Name, address, and country, if foreign; (2) Federal or civilian

organization; (3) Position held; (4) Professional board status, certified or eligible; (5) Degree in specialty; and (5) Military rank. Those wishing to attend should write to the Director, Armed Forces Institute of Pathology, ATTN: AFIP-EDZ, Washington, D.C. 20306.

DENTAL OFFICERS SELECTED FOR ADVANCED TRAINING

Forty-four dental officers were selected for residency training in FY78/79. The selectees are listed under training locations.

National Naval Dental Center, Bethesda, Md.

Comprehensive Dentistry (first year): CDR Robert L. Jucovics; LCDRs Paul L. Auclair, David R. Fitch, Courtney C. Lamb, Vincent M. Lynch, George R. Myers, and Richard F. Sobie; LTs Benjamin S. Antioquia, William J. Boyd, George W. Freeman, Charles F. Massler, and Thomas F. Starck.

Comprehensive Dentistry (second year): LCDRs Melvin L. Davis, John W. Hargrave, Raymond J. Kiehl, Mark J. Mailander, and John J. Rizas; LT James T. Judkins.

Endodontics: LCDRs John J. Boyd, Thomas J. Boyer, and Randolph M. Stevens.

Oral Medicine: LCDR Walton A. Rathbun, Jr.

Periodontics: LTs Douglas E. Mitchell, George Quintero, and John E. Trapp.

Prosthodontics: LCDRs John D. Schroeder, Edward M. Fraleigh, James W. Taylor, Robert B. Linville, and Jerry E. Morley; LT Gerald J. Barna.

Maxillofacial Prosthetics: CDR James J. Shanley.

Oral Pathology: LCDR Gary R. Warnock.

Naval Regional Medical Centers

Oral Surgery: LCDRs Michael J. Kelley, Richard P. Rog, Timothy S. Smith, and Charles B. Stuller; LTs Jeffrey A. Lane and Michael P. Mullen

Advanced Training at Civilian Universities

Endodontics: LCDR Joseph W. Lehman III.

Operative: LCDR Michael T. Hanst.

Periodontics: LCDR John Common.

Prosthodontics: LCDRs Arthur S. Daley, Jr., and Robert L. Duell.



Features

Navy Flight Surgeons: From Biplanes to Skylab

Jacquelynne M. Devine

Navy aviation medicine got its start on 8 Nov 1921, when five Navy medical officers were ordered to report to the Army School for Flight Surgeons at Mitchell Field, Long Island, N.Y.

The school, established in May 1919 as the Army's Central Research Laboratory, offered the first formal course in the new discipline: aviation medicine.

Those naval pioneers were LTs Victor S. Armstrong, Louis Iverson, Julius F. Neuberger, Page O. Northington, and Carl J. Robertson. Their class graduated on 29 April 1922. One year later, Dr. Armstrong was ordered to the Bureau of Medicine and Surgery to become the first chief of the Aviation Medicine Division.

Even with its own division aviation medicine was still a fledgling, as was all of naval aviation. Flight surgeons of the 1920's and 1930's often had duty at other than aviation facilities. Flight pay was allocated to aviation units, and the commanding officer decided whether to authorize flight pay for individual flight surgeons.

Navy flight surgeons trained with the Army at Mitchell Field until 1926. When the Army moved its school to Brooks Field, Tex., that year, the Navy seemed to lose interest in training flight surgeons: only 25 such officers were trained between 1926 and 1935.

During these years a curriculum for flight surgeons was established

at the Naval School of Medicine in Washington, D.C. One class of eight students graduated on 29 April 1927. Records indicate, however, that no more flight surgeons were trained for the next three years.

Commodore Wilbur E. Kellum, now retired, remembers what it was like to train as a naval flight surgeon in those early days:

"While I was attending the Naval Medical School in 1931, I expressed an interest in aviation medicine.

struction in land planes at Corry Field. By that time an individual was usually considered qualified to fly solo, but we were not permitted that bit."

Dr. Kellum, who is credited with designing a prototype of the oxygen mask, provides us with the first evidence of flight training as part of the flight surgeon curriculum. But he was not the first Navy medical officer to fly. LT Bertram Groesbeck, Jr., had been ordered to flight training in 1921. He was des-



Navy members of first class of flight surgeons, shown here with friends and instructors, were (top row): LTs Iverson and Robertson (3rd & 4th from left); LTs Armstrong and Northington (7th & 8th from left); and LT Neuberger (3rd from right)

One of the staff members, Joel White, who had completed the Army's course in 1925, told me that if I wanted to stay on in Washington I could use his notes from school.

"I reported to the Naval Air Station, Pensacola, for indoctrinal flight training on the 26th of September, 1931. This consisted of ten hours of dual instruction in training planes on floats. We flew around and around Pensacola Bay practicing landings on the water. This was followed by ten hours of dual in-

signed a naval aviator in 1922 and immediately reported to Mitchell Field for training as a flight surgeon.

During the late 1920's and 1930's there was pressure on the Bureau of Medicine and Surgery to establish a permanent Navy school for flight surgeons. Principal proponents of the Navy training were two medical officers: CAPT J.C. Adams and CAPT Frederick Ceres.

CAPT Adams, a graduate of the second Navy class at Mitchell Field,

Jacquelynne Devine is public information specialist at the Naval Aerospace Medical Institute, Pensacola, Fla. 32508.

was head of the Aviation Medicine Division; CAPT Ceres, a graduate of the third class, was medical officer for Naval Air Station, Pensacola.

While the Navy wouldn't go along with establishing its own school, it did begin again to send Navy medical officers to the Army's school—by then located at Randolph Field, Tex. An additional 20 Navy physicians trained there between 1935 and 1939, reporting afterwards to Pensacola for six months of flight training and training with other qualified flight surgeons.

A SCHOOL OF THEIR OWN

On 8 Nov 1939, President Franklin D. Roosevelt declared a limited state of emergency, and the medical department at Pensacola was told to establish a curriculum for aviation medical examiners. Twelve days later, nine Reserve medical officers reported for training. CAPT Ceres was given responsibility for organizing a training course and administering the program. A manual was hurriedly put together from notes kept by flight surgeons who had completed the Army course.

Classes were first held in one room of the Pensacola Naval Dispensary. In December, the medical department and the new School of Aviation Medicine moved into new but cramped quarters in a building whose plans had been drawn up long before space for a school became a consideration. That building still stands, its many additions attesting to the accommodations made to support the Navy School of Aviation Medicine.

But the Navy still had not accepted the concept of training naval flight surgeons. Emphasis was on the need for administering flight physical examinations, and the first graduates of the school were designated aviation medical examiners. The 60-day program offered instruction in cardiovascular disease, neuropsychiatry, general physical examination, dental examination, and eye, ear, nose and throat disease.



Naval Air Station Pensacola in 1940s. Dispensary is in foreground; Naval School of Aviation Medicine in background



Navy flight surgeon and flight nurse check on patient before hospital plane takeoff (Feb 1945)

Although CAPT Ceres had been ordered to establish the school, he was not authorized additional staff members. The first faculty therefore was made up of CAPT Ceres, CDR Victor S. Armstrong, CDR Frank E. Tierney, LCDR William W. Davies, LCDR Rex H. White, LCDR Wilbur E. Kellum, LCDR

Anselm C. Hohn, LT Julian Jordan, and CAPT Alfred W. Chandler, a Dental Corps officer.

In July 1940, five regular Navy medical officers were ordered to the school to be trained as naval flight surgeons. Training included the 60-day didactic program with a Reserve class, plus a 60-day ground school and flight indoctrination phase. A third phase consisted of six weeks' additional duty at outlying fields and aviation examining rooms, working under the direction of more experienced flight surgeons.

The first class of flight surgeons graduated from the Navy School of Aviation Medicine on 30 Nov 1940.

RESEARCH AND DEVELOPMENT

In 1940, the immediate problems of aviation medicine involved medical research and pilot selection. To help in these areas, the school established a department of research, with a staff of some of the finest scientists from the civilian community. A good number of these civilians came on active duty during World War II and made sig-

nificant contributions in the field of aerospace medicine. Notable among these researchers were Drs. Ross McFarland, Eric J. Liljencrantz, Joseph L. Lilienthal, and Ashton Graybiel.

Dr. McFarland, from Harvard University, pioneered the medical support of Pan American Airways and did much physiological research into the effects of altitude as well as work in pilot selection criteria. He was commissioned in the Naval Reserve and was a member of the Harvard study group that conducted the famous Thousand Aviator Study. He wrote the classic text, *Human Factors in Air Transportation*, published in 1953.

Dr. Liljencrantz, who had been head of Pan American's medical facility in San Francisco, came on active duty as a lieutenant commander to continue his research work. He was killed on 5 Nov 1942 near NAS Pensacola while engaged in an experimental research flight.

Dr. Lilienthal joined the staff from the Johns Hopkins University School of Medicine and worked on the effects of reduced barometric pressure, carbon monoxide, and airsickness, as well as selection criteria for aviators.

Dr. Graybiel over the years became involved with almost every aspect of research. He was director of research after World War II and retired as a Navy captain. Following his retirement from active duty, Dr. Graybiel continued working in medical research and is today on the staff of the Naval Aerospace Medical Research Laboratory—a direct descendant of the original School of Aviation Medicine.

WORLD WAR II

With the onset of World War II, the training program was accelerated and classes convened more frequently. The well-trained flight surgeon was proving to be indispensable in keeping fliers healthy and fit to perform their duties.

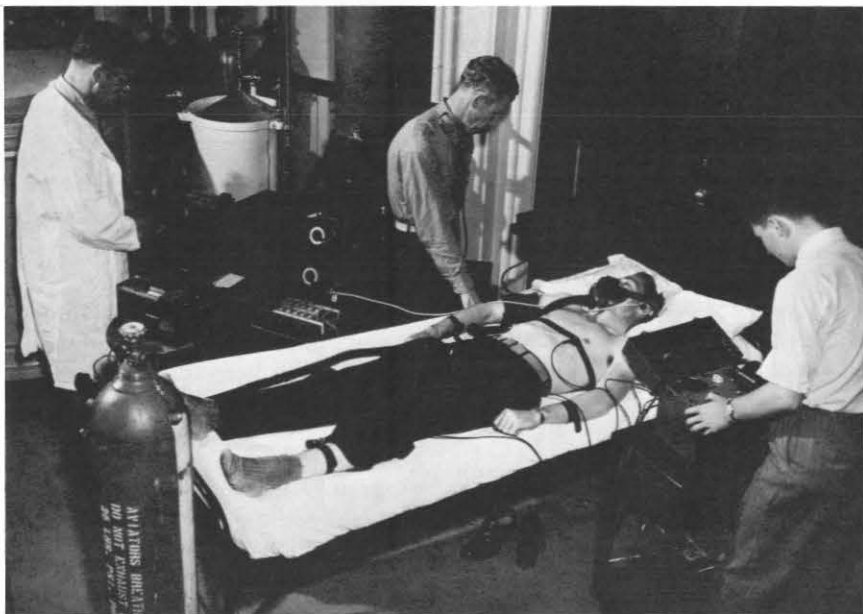
The school curriculum began to emphasize support of operational

units. The original concept of creating aviation medical examiners for cadet selection boards had stressed physical examination and selection. Now the emphasis moved to operational aviation medicine, maintenance of pilot health, survival, air evacuation, and many other important areas.

In the opening phases of World War II, the school had a staff of 15 officers. Subjects taught were: aviation history, aviation medicine, dental lectures and demonstrations, Navy regulations and customs,

tional unit after graduation from the School of Aviation Medicine, accumulate 60 hours of flying time, and be recommended by their senior medical officer. Most of the students who graduated as aviation medical examiners were redesignated flight surgeons by the end of the war.

Then, on 18 May 1942, the Chief of Naval Personnel authorized the first flight surgeon insignia. It was to be worn "on the left breast by officers of the Medical Corps who qualified as naval flight surgeons."



Staff members at Naval School of Aviation Medicine test a volunteer for coronary insufficiency (March 1949)

ophthalmology, otolaryngology, normal psychology and personality study, psychoneuroses and psychoses, physiology, cardiology, aviation physical examinations, physiological optics, psychological tests and testing, administration, and service customs and courtesies. Flight surgeons were even taught to march.

By 1942 the naval flight surgeon had become an integral member of the aviation community and had begun to get special recognition. First, provisions were made for aviation medical examiners to change their designation to naval flight surgeon. To do so they had to complete six months with an opera-

The insignia was a winged metal pin with an ovoid central device surcharged with the gold leaf and silver acorn insignia of the Navy Medical Corps. There was a fringe below the central device and three horizontal wing feathers were on each side.

It was fitting that CAPT Ceres was the first to wear the new insignia. The wings were fashioned by the Dental Department and presented to CAPT Ceres on 19 July 1942 when he left the School of Aviation Medicine and the NAS Pensacola medical department.

A third milestone was reached on 10 Oct 1942. The Secretary of the Navy sent to the Chief, Bureau of

Supplies and Accounts, an amended definition of "nonflying officer." Navy flight surgeons were, for the first time, administratively included under the term "flying officers" and were entitled to draw flight pay while detailed to duty involving flying.

Naval flight surgeons proved their worth and mettle during the war. More than 1,200 flight surgeons were trained at the School of Aviation Medicine; 27 of them died in the line of duty.

POST-WAR YEARS

The post-war years were not growing years for Navy flight surgeons. The first class to convene after hostilities ended had only seven students. Small classes were to be the rule rather than the exception for another six years.

On 15 Oct 1946, the school became a command. For the first seven years it had operated as an adjunct to the station's medical department, with no official status: now the school was a component of the Naval Air Basic Training Command.

In peacetime, many flight surgeons left active duty. Only a handful remained.

The first jolt to this placid posture of "peace" came with the Berlin Crisis in 1948. LTJG Richard D. Nauman, later to be one of the few flight surgeons to attain flag rank, became intimately involved with the Berlin Crisis. Assigned as flight surgeon for the two Navy squadrons involved with "Operation Vittles," he participated in 25 missions.

Less than two years later the peace was not just jostled but shattered. On 25 June 1950, North Korea invaded South Korea. Two days later President Harry S. Truman ordered U.S. forces to the support of South Korea. On 3 July 1950, Air Group 5 from USS *Valley Forge* made the first air strikes. A new generation of flight surgeons was introduced to combat.

Again, the School of Aviation Medicine went into full operation.



Flight surgeon training in 1958 included learning the fine points of eye examination under guidance of an instructor

From classes of 6 or 7, the numbers swelled to 25 and more. Refresher courses were held for former flight surgeons recalled to active duty.

The naval flight surgeon program, like other military training programs, was retained after the end of hostilities. The new watchword was "readiness."

In the midst of this growth, the school was again redesignated. No longer a component command with an officer in charge, the school became a command in its own right. CAPT Leon D. Carson made the transition from officer in charge to commanding officer on 9 July 1951.

GROWTH

In 1955, after several years of work by the Aeromedical Association, the American Medical Association Committee on Medical Education, and the American Board of Preventive Medicine, a program was adopted by the American Board of Preventive Medicine which would lead to certification in the specialty of aviation medicine. Many senior naval flight surgeons were able to qualify without examination, while

others qualified after examination. A formal program of advanced training was established at the School of Aviation Medicine, and the following year the curriculum was approved by the American Board of Preventive Medicine for two years' formal credit.

On 19 Dec 1956, the Chief of Naval Air Training established the Special Board of Flight Surgeons. This permanent board of medical officers was appointed at the school to "provide prompt and highly competent professional review of the physical qualifications of aviation trainees and to expedite processing of those not qualified to continue training." The senior member of the board was the school's commanding officer.

In the 21 years since then, the Special Board of Flight Surgeons' scope has expanded to include not only aviators in training but also aviators already assigned to the fleet. The board reviews medical findings and makes recommendations to the Bureau of Medicine and Surgery concerning the physical qualifications of all aviators who appear before it.

THE SPACE AGE

Some flight surgeons have held dual designations as flight surgeon and naval aviator. In 1975, two training billets annually were authorized for continuing this dual training. The best known flight surgeon/naval aviator is astronaut CAPT Joseph P. Kerwin, a graduate of flight surgeon class 89.

Flight surgeons have made notable contributions to aviation medical research. In the embryonic space age, staff members at the school designed a space capsule for primates and trained primates for space shots. "Baker," the first primate to survive a trip into space, was trained at the School of Aviation Medicine.

New equipment and personnel were added to the school's research department during the 1950's and 1960's, and many projects were funded by the newly formed National Aeronautics and Space Administration.

LCDR Victor A. Prather, a naval flight surgeon, was the medical investigator on Strato Lab No. 5, a Navy high-altitude balloon flight. On 4 May 1961, ascent was made to an altitude of more than 113,000 feet—a new record. Tragically, LCDR Prather drowned during recovery of the balloon.

By September 1965, it would have been difficult for the graduates of flight surgeon class 1 to recognize their alma mater. No longer a one-room school house, the School of Aviation Medicine and its mission had expanded so dramatically that a new name was in order: it became the Naval Aerospace Medical Institute.

The Research Department was also advancing. On 19 Jan 1970, that department was redesignated a component command of NAMI and renamed the Naval Aerospace Medical Research Laboratory. The laboratory became a separate command on 1 July 1974, with Navy flight surgeon CAPT Newton W. Allebach as first commanding officer.

Throughout the Navy, change



CAPT Kerwin, first physician in space, checks out bicycle ergometer

was taking place. One significant change was in the status of military women. Not immune to these changes, the flight surgeon program on 21 March 1974 graduated its first female flight surgeons, LTs Jane McWilliams and Victoria Voge.

Although the Navy recognizes the need for the special skills of naval flight surgeons, austere funding has limited the number available to the fleet. Aviation medical officers began training at NAMI in 1975 to help offset the shortages of flight surgeons in critical areas.

Also, a new breed of flight surgeons is now joining the operational forces. In August 1976, the first two flight surgeon/family practitioners graduated from NAMI. LCDRs Leon J. Davis and Barry Mullen completed their family practice residencies at the Naval Aerospace and Regional Medical Center in Pensacola, taking flight surgeon curriculum courses at NAMI during their final year. They were then ordered to flight training before being designated naval flight surgeons and reporting to their first operational billets.

For a number of years, naval flight surgeons received flight indoctrination in the T-34B "Mentor." Transition to the T-34C and base realignment jeopardized the flight portion of the flight surgeon



LT J. Gessler, MC (left), member of 1975 "Blue Chip" class, checks flight plan with instructor

curriculum in 1975. However, the commander of the Naval Air Training Command recognized the importance of this indoctrination and in 1976 authorized flight training for flight surgeons in the T-2, after the "Blue Chippers" of Class 75-2 proved it could be done.

For more than half a century the naval flight surgeon has overcome obstacles to make contributions to aviation, aerospace, and the nation. This group of dedicated men and women can be proud of their contributions, which have helped take the United States Navy from biplanes to Skylab.

Bruxism: Emotional Symptom or Dental Occlusal Problem?

LCDR Steven G. Detsch, DC, USN

Bruxism is a nonconscious, emotionally based or neurogenically related habit of grinding, clenching, clamping, or pressing the teeth together. It can occur while a person is awake or asleep. Like other oral habits—such as tongue thrusting or biting the fingernails, lip, or a hard object—bruxism is a frequently repeated practice that may injure the teeth, their attachment apparatus, or the temporomandibular joint. The original term "la Bruxomanie" was coined in 1907 by Marie and Pietkiewicz (1) to designate habitual grinding of the teeth, which was thought to be caused by certain cortical brain lesions. The term "bruxomania" is now reserved to describe grinding of the teeth as a neurotic symptom.

The etiology of bruxism is unknown. Two mechanisms have been proposed: first, that bruxism is an outlet for emotional or psychic stress; second, that it is caused by an increase in neuromuscular irritability due to occlusal disharmonies. Ramfjord (2,3) believes that both mechanisms are necessary to produce bruxism.

It is quite possible that bruxism occurs universally—that almost every person occasionally, when under stress, will press or grind his teeth. Various studies quote incidences of 80% to 90% (2,3,4); however, most patients are unaware of the habit, and a case history is therefore unreliable. Perhaps more indicative of bruxism's prevalence is the 98% occurrence of occlusal wear facets on adult teeth (5).

Considering the prevalence of bruxism, the fact that a person may press or grind his teeth while under stress is of little significance unless there are

signs or symptoms of trauma in the masticatory system. Clinical and radiographic signs compiled from several authors (2,3,6,7) are listed in Tables I and II.

Bruxism has been indicted as a principal cause of temporomandibular joint (TMJ) myofascial pain dysfunction syndrome (8). An increase in bruxism has been observed shortly before the onset of TMJ symptoms (9). But while bruxism may produce occlusal trauma, it does not produce periodontal pockets and has no effect on the gingiva.

Ramfjord (3) states that any signs and symptoms of bruxism elicited from a patient during examination should be brought to the patient's attention, whereupon "the habit will often be brought up to the conscious level and a positive history of bruxism may be obtained at a subsequent appointment."

POSSIBLE CAUSES

Mikami (9) believes that bruxism may relieve mental or physical stress. He hypothesizes that "the teeth of bruxists serve as a release mechanism for overt aggression." In other words, bruxism is "a mechanism for achieving gratification for blocked drives and desires" in a socially invisible, internal, and acceptable mode.

Although Reding et al (10) found no significant personality differences between nocturnal bruxers and controls, an interesting psychological profile may be compiled from the Olkinuora studies (11,12) of 69 bruxers and 42 controls. In comparison with the controls, the bruxers were found to be more meticulous, more successful in school, more emotionally unstable, and more tense in special situations. Also,

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TABLE I. Clinical Signs and Symptoms of Bruxism

<p>Nonmasticatory patterns of occlusal wear of teeth.</p> <ul style="list-style-type: none"> • Incisal or occlusal attrition: Facets, flattening of incisal tips of cuspids, fraying of incisal edges of central and lateral incisors. (Wear can occur on both natural and artificial teeth.) • Cupping of exposed dentin associated with severe wear. • Severe attrition, leading to: <ul style="list-style-type: none"> Loss of vertical dimension. Loss of marginal ridges, producing open contacts and areas of food impaction. Loss of holding contacts. <p>Unexpected fractures of teeth and restorations; cracked teeth or chipped enamel.</p> <p>Unexpected mobility of teeth.</p> <ul style="list-style-type: none"> • General or localized mobility. • Fremitus. • Migration of teeth; fanning of anterior teeth. <p>Pulpal hyperemia with sensitivity, especially to cold.</p> <p>Dull percussion sound from teeth.</p> <p>Soreness of teeth to biting stress.</p>	<p>Increased muscle tonus; hypertrophy of masticatory muscles, especially the masseter; and uncontrolled resistance to manipulation of mandible.</p> <p>Soreness of masticatory muscles to palpation.</p> <p>Feeling of fatigue in jaw muscles when patient awakens.</p> <p>Locking of jaws.</p> <p>Biting of lips, cheeks, fingernails, or hard objects like pens, pencils, and eyeglass frames.</p> <p>Pain in temporomandibular joint, or history of subluxation.</p> <p>Tension or emotional headaches associated with abnormal muscle tension.</p> <p>Maxillary and mandibular exostoses.</p> <p>Periodontal abscess formation.</p> <p>Audible nocturnal grinding.</p>
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bruxers suffered more from headaches and muscle pains, and they felt more isolation. Most of the bruxers were females. The presence of this habit in the bruxers was predicted by the Alanen Rating Scale (a measure of emotional disturbance).

Nadler (4) mentioned several occupationally related sources of bruxism: for example, people engaged in precise and meticulous work, "such as watchmakers, die makers, machinists, and diamond cleavers," may clench their teeth as a relief from mental tension. Others likely to clench their teeth are athletes in strenuous competition, motorists applying the brakes, or housewives trying to open a jar. Similarly, children may grind or clench their teeth while studying, during examinations, as a reaction to pain, or when rejected by playmates. Nadler thought that chewing gum or tobacco, and biting or chewing pencils, toothpicks, pipstems, or bobby pins might all be considered forms of bruxism.

Bruxism's association with sleep is interesting. Several authors (13-17) relate bruxism to periods of stage V rapid eye movement sleep (REMS), which has been linked to dreaming. During REMS, a paradox occurs. Muscle tension increases in the jaw while the neck, trunk, and limb muscles—after a few quivering, or myoclonic, movements—become completely slack (17). A person will go through four to

TABLE II. Radiographic Signs of Bruxism

<p>Widening of periodontal ligament space.</p> <p>Root resorption.</p> <p>Hypercementosis.</p> <p>Osteosclerosis.</p> <p>Root fracture.</p> <p>Uneven thickening or complete loss of lamina dura.</p> <p>Angular bone loss and bone loss in furcation areas of multi-rooted teeth.</p>
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six REMS periods, at intervals of approximately 90 minutes, in the course of a night's sleep. In REMS, which occupies about 20% of the total period of sleep, contractions of the masseter muscles occur at a rate of 20.9 per hour as compared to 5.3 per hour during non-REMS periods.

Robinson et al (18) postulate that nocturnal grinding of teeth is associated with all stages of sleep, with a preponderance in stage II or partial arousal from sleep, which is akin to sleepwalking, neurosis, and nightmare. This phenomenon would

indicate that bruxism could be triggered by sleep-disturbing stimuli.

Cluster headaches—a variety of migraine or vascular headaches—also often develop at night or in periods of dozing, and especially during REMS (19).

Ramfjord (3), in his electromyographic study, made the association between occlusal interferences, which he labeled trigger factors, and an increase in hypertonicity or irritability of muscles. Ramfjord's trigger factors were:

- discrepancy between centric relation and centric occlusion.
- balancing side and working side interferences.
- gingival flaps on third molars.
- gingival hyperplasia.
- TMJ or muscle pain.
- surface irregularities of tongue, cheek, or lips.
- relation of tooth roots to maxillary sinus.

Ramfjord also stated that although the neuromuscular control is highly adaptive and can learn to avoid occlusal interferences, it is much more difficult to avoid interference related to swallowing. In bruxers, he observed a disturbed contraction pattern during swallowing, and hypothesized that this disturbance was caused by a slide from centric relation to centric occlusion.

Once the irritability threshold of muscle is reached, overfatigue and pain from sustained contraction perpetuates the hyperirritability. Ramfjord thought that bruxism could be eliminated by removing occlusal discrepancies, which would break this cycle. He was able to show a return to normal muscle tonus, as measured by the electromyograph, following occlusal adjustment in bruxers.

Dawson (20) and others (21) went further and said that if bruxism was not eliminated by occlusal adjustment the practitioner was performing the procedure improperly. This premise overlooks the incidence of bruxism in patients with no occlusal anomalies, in edentulous babies or adults, and in people with any of numerous systemic problems, including nephritis, meningitis, dementia epilepsy, chorea, and cerebral spastic infantile paralysis. The concept that tooth contact in chewing and most swallowing occurs in habitual occlusion and only occasionally in centric relation (22) also throws some doubt on the occlusal origin of bruxism.

As dentists, we find it easier to locate abnormalities of occlusion than to identify predisposing systemic or emotional factors (23). This does not mean that occlusion is the sole etiologic factor. Occlusal dysfunction is extremely common, but only a small

percentage of patients who have it develop severe signs and symptoms or TMJ disorders. Nevertheless, abnormal muscle contraction and joint disorders usually respond to occlusal therapy. Underlying emotional disorders should, however, also be treated.

TREATMENT

Mikami (9) sets four objectives in the treatment of bruxism: "(1) reduce psychic tension, (2) treat the signs and symptoms, (3) minimize occlusal irritations, and (4) break neuromuscular habit patterns."

Treatment must be geared to the degree of severity of the bruxism. If there are minimal signs or symptoms, the dentist need render little or no treatment aside from listening to the patient and acknowledging that he cares if the patient has a particularly stressful problem. But as the patient's symptoms increase, other modes of treatment may be considered. Treatments for reducing psychic tension include:

- therapist's empathy with the patient.
- education of the patient.
- hypnosis and autosuggestion.
- tranquilizing agents.
- suggestions for hobbies or vacations.
- recommendations for modifying an uncomfortable sleep environment.
- relaxation therapy.
- psychotherapy.

Bell (24) suggested the following treatments for bruxism:

- occlusal splint or night guard.
- occlusal adjustment (prophylactic adjustments of occlusion are not indicated in the absence of symptoms).
- hot showers.
- heat packs.
- ultrasound.
- ethyl chloride spray.
- dry needle insertion into muscle.
- injections of lidocaine.
- exercises.
- drug therapy.

Mikami's (9) conclusion is most apt:

Habits resulting from lifelong neuroses are difficult to extinguish, since bruxism is a socially acceptable stress-releasing activity. Our dental therapeutic measures strive to decrease the levels of mental and occlusal stress below some unknown threshold of stress in the individual. If this level is reached or exceeded, even after thorough dental care, the individual will likely resort to the same mechanism for stress release or dissipation. Bruxism, then, is not permanently treated but merely managed.

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Laboratory Techniques

Gram Stain Interpretation in Detecting GC

In reporting the results of gram stains for *Neisseria gonorrhoeae*, Medical Department representatives must realize the limitations of the stain alone, and must be aware of the restrictions on interpretation of clinical or laboratory data when services for definitive identification are not available.

The method for reporting the results of a gram stain examination is extremely important, and a semi-quantitative reporting system, developed by agreement with those the laboratory serves, is suggested.

The report should include the presence and amount of polymorphonuclear leukocytes (PMNs) and epithelial cells. It should also indicate the morphology, staining characteristics, numbers and location (i.e., intracellular) of all bacteria seen. The following system is suggested for uniformity:

4+ = more than 30 cells per oil immersion field
 3+ = 5-30 cells per oil immersion field
 2+ = 1-5 cells per oil immersion field
 1+ = less than 1 cell per oil immersion field

The use of the term "gram-negative intracellular diplococci" should be applied only when the microscopic appearance is consistent with that of acute gonorrhea in the male, with several pairs of gram-negative kidney-shaped diplococci within individual PMNs. Coccoid forms that are not gonococci are sometimes seen attached to or within leukocytes. These may be short forms of gram-negative rods or gram-positive cocci which have either lost their staining properties or been over-decolorized.

Culture. One should always collect a culture when dealing with urethritis where gonorrhea is a possibility. The culture will aid diagnosis where gram stains are inconclusive or perhaps misinterpreted, and it is a "must" when test-of-cure exams are performed. The gram stain on an early test-of-cure culture may have gram-negative diplococci that are actually nonviable *Neisseria* organisms. Unless a proper culture is taken, nothing can be said about the viability of these organisms; therefore, evidence for effective treatment is inconclusive.

Finally, one must realize that there is no specificity for each individual smear; thus, only what is seen should be reported. Diagnosis should be aided by extensive laboratory confirmation.

—Adapted from the Pacific Health Bulletin, Nov 1977

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